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Black shale	0-6	1166-6
COAL	0-2	1166-8
Dark-blue shale	3-4	1170
Hard, black shale	5	1175
Hard, dark shale, lime in it	2	1177
Hard, black, laminated shale	10-9	1187-9
COAL	2-4	1190-1
Dark shale	0-11	1191
Dark slate	6-6	1197-6
COAL	1-3	1198-9
Dark slate	2-3	1201
Dark shale	19	1220
Dark, sandy shale	28	1248
Dark, sticky shale	8-6	1256-6
COAL	0-11	1257-5
Sandstone	0-1	1257-6
Sandstone, shale partings	9-6	1267
Sandstone, dark partings	20	1287
Sandstone, shale partings	10	1297
Hard, black shale	2	1299
White sandstone	8	1307
Sandstone	8	1315
Limestone	38	1353

ANALYSES OF THE MISSISSIPPIAN (SUBCARBONIFEROUS) LIMESTONE FROM THE ATCHISON PROSPECT WELL.

BY FRED B. PORTER, LAWRENCE.

Read before the Academy, at Topeka, December 29, 1900.

After the core of the diamond-drill prospect well at Atchison was brought to the University of Kansas, two samples of the lowest strata reached by the well were analyzed in the quantitative chemical laboratory, under the direction of Prof. Edward Bartow. A sample from a point twenty-six feet from the bottom and 1124 feet below the surface was analyzed by Maud Hodgdon, and a second sample, from the last six inches of the core, was analyzed by N. L. Stewart and the writer.

The results of the analyses are as follows:

	No. 1. Hodgdon.	No. 2. Stewart.	No. 3. Porter.
Silicious matter	2.34	....	3.63
Silica (SiO_2)	....	2.27*	....
Iron oxid (Fe_2O_3)	....	.49*	....
Aluminum oxid (Al_2O_3)	.65	.34*	.36
Calcium oxid (CaO)	52.98	52.45*	53.11
Magnesium oxid (MgO)	.52	.72	.48
Carbon dioxid (CO_2), calculated for CaO and MgO	42.16	42.02*	42.29*
Carbon dioxid, determined	(.......)	(42.41)	(42.15)
Moisture (H_2O)	.08	.14	.09
Totals	98.73	98.43	99.96

The analyses marked (*) are from single determinations; the remainder, from an average of two or more.

A hypothetical combination of the above constituents is as follows:

	No. 1.	No. 2.	No. 3.	Galena.
Silicious matter, or SiO_2	2.34	2.27	3.63	1.00
Iron and aluminum oxids	.65	.83	.36	.69
Calcium carbonate ($CaCO_3$)	94.58	93.68	94.84	97.32
Magnesium carbonate ($MgCO_3$)	1.08	1.51	1.04	.80
Water (H_2O)	.08	.14	.09	......
Totals	98.73	98.43	99.96	99.81

Column 4 gives an analysis of the Subcarboniferous from Galena, recorded in the United States Geological Survey for 1894, part IV, page 505, and shows the relation of composition of the same strata in two localities.

ANALYSIS OF MAGNESIA WATER FOUND NEAR MADISON, KAN.

BY F. W. BUSHONG, COLLEGE OF EMPORIA, EMPORIA.

Read before the Academy December 29, 1899.

The following is an analysis of well-water from the farm of Mr. Arnold Girard, Madison, Kan., section 2, township 22 south, range 12 east; depth of well about thirty feet:

Substances (estimated) per liter.			Corresponding to the following salts, calculated in 1,000,000 parts:		
SiO_2	0.0128	grams.	Silica (SiO_2)	13	parts.
Fe_2O_3 and Al_2O_3	0.0118	"	Clay bases(Fe_2O_3 and Al_2O_3),	12	"
CaO	0.5712	"	Magnesium sulph. ($MgSO_4$),	1,903	"
MgO	0.6403	"	Calcium sulphate ($CaSO_4$),	830	"
Na_2O	0.7042	"	Calcium carbonate($CaCO_3$),	396	"
Na_2CO_3	0.0636	"	Sodium sulphate (Na_2SO_4),	1,380	"
SO_3	2.5446	"	Sodium carbonate (Na_2CO_3),	63	"
Cl	0.0698	"	Sodium chlorate ($NaCl$)...	115	"

THE MUSCOTAH ARTESIAN WELLS.

BY E. B. KNERR, MIDLAND COLLEGE, ATCHISON.

Read at Topeka December 28, 1900.

Along the base of the east bluffs of the Grasshopper valley, about one and a half miles south of Muscotah, there are a series of interesting low, marshy mounds. The mounded area on the farm of Mr. H. M. Rice is about a hundred rods long by fifteen rods wide, and the mounds are five to eight feet high. About a quarter of a mile farther south, on S. H. Hubbard's farm, is another mound, about fifteen yards wide, sixty yards long, and eight or ten feet high. Two miles farther south, on James Miller's place, there are similar mounds. A swamp is usually low ground, but here the swampy ground is the highest. Early in September, 1900, Mr. Rice concluded that if he were to sink a pipe near one of these mounds he would get an artesian flow of water. He bored a test hole with a two-inch auger, and at a depth of thirty-four feet struck a flow of water so strong as to force up pebbles the size of hickory-nuts. A two-inch pipe was forced into the hole, and the water rose to overflow this when it stood fifteen feet above ground. The flow from this two-inch pipe is fifty gallons every fifty-five seconds. The water is as clear as crystal, very palatable and cold, registering a temperature of fifty-six degrees F. The water deposits a slight iron coating over the barrel into which it flows. Calcareous deposits are also found in places about the mounds, indicating mineral properties for the water.

The formation of the mounds is explained by the water pressure carrying up sand and soil and depositing it at the surface. The mounds are covered by bulrushes, cattails, and other usual swamp growth, which holds the soil, preventing its being washed down. The water springs from over the whole surface of the mounds, and away in small streams. Thus, the peculiar circumstance arises that the swamp is high ground, and the firm soil is lower. The date of the above observations was Saturday, September 22, 1900.